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ABSTRACT

In 1990, a study was conducted at Tompkins Cortland Community College (TCCC) to determine if there was a significant difference in the personal characteristics of applicants for full-time study who actually attended and those who did not attend the college. In addition, the study sought to identify those variables that accounted for the largest variance between the two populations. The study population included 557 students who applied to, were accepted at, and paid a deposit to attend TCCC as full-time students in fall 1988. Of these students, 507 were attendees and 50 were non-attendees (students who were not registered for any classes during the first 3 weeks of the semester and were not included in the college's official census). The independent variables examined were age, sex, date of deposit (refund date), prior college experience, distance from campus (commuter status), high school decile rank, high school graduation status, and intended major at college. A stepwise multiple regression, used to rank the variables in terms of their predictability for non-attendance, placed commuter status first, followed by graduation status, high school decile rank, and refund date. In spite of the ranking, however, none of the correlations were statistically significant for any variable. Collectively, the first four variables accounted for only 4.54% of the variance between the groups of attendees and non-attendees. The study includes a literature review and recommendations for future research. (JMC)

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Discriminant Characteristics of Non-attendees at Tompkins Cortland Community College

a report by

Robert O. Ross
Dean of College Services

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INTRODUCTION

In pondering college attrition, consideration should be given to examining the earliest group of leavers known in admissions circles as no-shows or non-attendees. These are the individuals who were recruited, applied and were accepted, paid their deposit but failed to show at the start of the semester. Much has been written about attrition among college-going students and the converse, retention. Yet, the subject of non-attendees has received little attention.

It is well known that the pool of traditional college-aged students will continue to shrink well into the 1990's and that competition among schools for students will only intensify. Directors of admissions frequently speak of student flow models shaped like a funnel. If numbers of students at a given institution are a problem the director must look toward enlarging the funnel at every possible opportunity. In a traditional view, areas that can be affected are the size of the prospective pool and the institution's degree of selectivity. The top of the funnel can be increased by expanding the geographic area in which recruiting takes place. This is often a costly proposition as it

usually involves more recruiters traveling greater distances. The flow through the funnel can also be enhanced by lowering admissions standards--an option available in selective colleges, but one not usually viewed as desireable nor an option available to most community colleges. Even if the flow could be increased by reducing standards another problem exists, that of leakage or the students who accept the offer to attend but then fail to show. If we could retain more of these already recruited students we might have a cost effective means of increasing the size of the freshman class.

BACKGROUND AND REVIEW OF THE LITERATURE

For many years the admissions office at Tompkins Cortland Community College reported only the number of paid applications received, and being a community college that was almost synonymous with the number of individuals accepted for full-time study. There were always a few individuals who did not show for the start of the fall semester. However, as competition increased and as the college worked to expand its applicant pool the number of non-attendees has become a significant problem. In the fall of 1987 there were 456 non-attendees from an initial group of approximately 800 applicants with paid deposits. The population of non-attendees increased by 800 percent in three years. To a large extent this is symptomatic of high school graduates applying to multiple colleges.

In an effort to learn about the non-attendee population at Tompkins Cortland telephone surveys were conducted in 1985 and in 1987. The 1985 study showed that the highest percent of non-attendees had obtained employment, with the second highest group attending college elsewhere. The 1987 study showed similar results with 46 percent of the respondents employed, 43 percent enrolled in another college and 11 percent citing "other" reasons for not attending. In the 1987 study based upon a representative sample of 176 out of a population of 456, contact was made with the applicant or the applicant's family in only 52 cases. While these surveys were perceived to be useful, the population is elusive as well as difficult and expensive to track down. The results can only be considered to be less than conclusive.

Other colleges have undertaken similar efforts to learn about their non-attendees. At Santa Ana University in 1978, Slark conducted a telephone study to determine why 30 - 40 percent of prospective students who applied for admissions failed to register for classes. Using a random sample of 130 individuals from a population of 1,758 non-attendees they successfully contacted 80 percent. Slark found that 42 percent failed to register because desired classes were closed or not offered, 16 percent attended other schools, and 13 percent gave employment as a reason. Kapiolani Community College studied no-shows for the Fall 1980 semester. A telephone survey was used to augment an

initial low response to their mail survey ultimately yielding a total return of 58 percent. The reported findings from Kapiolani indicated that 26 percent were attending another school while 63 percent were working. It was not known if this employment was a barrier to attendance at Kapiolani. DiCarlo's 1980 study at Greenfield Community college showed that a decision to attend another school and the fact that Greenfield did not offer the program that they wanted were the highest reasons for not attending. DiCarlo did not study or report on the characteristics of the non-attending population. McMaster at Mercer County Community College in NJ conducted a two year (1982,1983) study of non-attendees using an approach similar to that followed by Kapiolani, making use of a mail survey with follow-up telephone calls to increase the response rate to 22 percent. McMaster reports that fifty percent of the non-attendees enrolled at other colleges. Reasons given for enrollment at other schools were: visits to that campus, closeness to home, and athletic programs. While McMaster's study provides a great deal of information regarding reasons for non-attendance the study does not describe the characteristics of this population.

A study conduced by Yost at Trinity University is the only study found in which a researcher examined the differences in characteristics between attending and non-attending populations. Not only did Yost find significant differences between the two

groups but he was able to build a mathematical model that would predict within 68-75 percent accuracy who the non-attendees would be. Yost examined the characteristics of 486 individuals who applied and paid deposits and enrolled in the fall of 1983 as freshman with a group of 71 individuals who applied, paid deposits but later withdrew or simply did not show. While other studies examined those who applied but did not register (Slark, McMaster) or those who applied, were accepted and did not enroll (Kapiolani, DiCarlo), Yost chose to look at students who had indicated a higher of level of commitment in that they had also paid a deposit. As a result the "non-attendee" "n" in Yost's study was considerably lower (71) as compared to McMaster's "non-attendee" "n" of 698 or Slark's study in which the "non-attendee" "n" was 1,758.

The variables included in Yost's discriminant model were: verbal and mathematics Scholastic Aptitude Test scores, high school rank, high school grade point average, sex, amount of financial aid provided, and place of residence (in-state or out-of-state). Using techniques of multivariant analysis he showed significant differences between the two groups. Based upon these differences he created a model that weighted each characteristic or combination of characteristics that would be predictive of non-attendee behavior. The resultant model tested against the 1983 data was found to be predictive at the level of 75 percent. The predictive power of the model was diminished when tested against

1984 data, predicting only at the 68 percent level.

RESEARCH QUESTION

This study at Tompkins Cortland was primarily concerned with determining if there is a significant difference in the personal characteristics of applicants for full-time study who are "attendees" and those who are "non-attendees" on a set of independent variables. Second, the study sought to determine those variables which, in combination, accounted for the largest variance between the "attendee" and "non-attendee" populations. Finally, a model was to be developed that could be used to predict future "attendees" or "non-attendees" from the applicant pool based upon discriminant characteristics of the "non-attendee" population. The populations "attendees" and "non-attendees" are defined in the same manner used by Yost in that there are two subsets that make up the total of individuals who applied to, were accepted at, and paid a deposit to attend Tompkins Cortland Community College in the Fall of 1988 as full-time students. The independent variables examined were: age, gender, date of deposit (refund date), prior college experience, distance from campus (commuter status), high school decile rank, high school graduation status and major. Age was considered to be important as Slark reported non-registrants were generally older with an age range of 25-40, while at Kapiolani 43 percent of the no-shows were above the age of 25. Gender has not been

shown to be a discriminate between "attendees" and "non-attendees," however, as the data was readily available it was included. Slark reported that non-registrants had applied for admission earlier than registrants, this information is also consistent with the findings of Yost. For the purposes of this study deposits received before or after the deposit refund date were used as they represented more of a commitment than the application date as there was no fee associated with the application. Institutional research data at Tompkins Cortland also indicates that many non-attendees have some prior college experience. Slark found that non-registrants had more prior college experience than registrants. In several studies, distance from campus was cited as a reason for non-attendance. This was first examined as a continuous variable based upon the number of miles away from campus that the applicant resided and then as a dichotomous variable based upon an artificial grouping of those who were likely to be commuter or non-commuter students. Of the variables studied by Yost the SAT verbal and quantitative scores were not available for the entire population of this study, nor were local diagnostic test scores. Yost found high school grade point average to be a contributing factor. At Tompkins Cortland the applicant records were incomplete, many lacking high school grade point averages. The best information available as an indicator of prior academic achievement for this study was high school decile rank, which was included. Finally it was thought that choice of major may be an influencing factor,

especially the difference between students who are undecided, (those who select general studies as a major) and those who select Liberal Arts, or one of the business/technology programs. This study was undertaken in an effort to identify a predictive model for Tompkins Cortland Community College utilizing data collected during the admissions process.

RESEARCH METHODS

The study was planned to be executed in two phases with the second phase dependent upon the results obtained in the first phase. In phase I, data existing in the college's computerized admission, testing and registration systems formed the basis for the information needed to describe student characteristics on each of the above-mentioned variables. These descriptive statistics were developed to identify characteristics of the attending and non-attending populations (see table 1.). Next, an intercorrelation matrix was created to examine the relationships between the variables. The independent variables were then entered into a multiple regression analysis using Minitab's Stepwise regression routine with Fenter and Fremove set to zero, thus forcing the entry of all independent variables. It was planned that in phase II the individual variables that contributed most to the determination of group membership would be weighted in order to devise a formula to predict applicants who would be non-attendees. The model would be validated using

1989 applicant data.

Definitions:

1. Overall population examined were those individuals who completed the admissions process at Tompkins Cortland Community College for full-time study by having completed their application and paid their deposit. No differentiation was made between matriculated and non-matriculated students.

2. Attendees are a subgroup of the overall population they are individuals who enrolled and attended classes during the first three weeks of the semester and were included in the college's official census figures.

3. Non-attendees are individuals who were not registered for any classes during the first three weeks of the semester and were not included in the college's official census. These individuals may have formally withdrawn their application, may have had their deposit returned, or may simply have been no-shows. Non-attendees are a subgroup of the total population, they together with the attendees, equal the total population.

4. Variables. The following lists the variables to be studied for each group and the characteristics of the data.

1-age	Continuous variable expressed as number of years from date of birth to Sept 1 of the semester in which the student was to enroll.
2-gender	Dichotomous variable where 1 = male and 0 = female.
3-refund date	Dichotomous variable where individuals who submitted their application on or after the date (6/1/88) at which the deposit would be refunded are coded as = 0 and those who submitted their application prior to this date are coded as = 1.
4-prior college	Dichotomous variable where 1 = yes and 0 = no. If the student's record indicated either transfer, reinstate or continuing status they were treated as having prior college.
5-commuter status	An artificial group was created where 1 = non-commuter and 0 = commuter. Individuals were placed into groups as follows: first the number of miles based upon a straight line measurement on a map from the campus to the center of the student's hometown was determined. Next those who lived less than 30 miles from campus were considered to be potential commuters and were classified as commuters, those living 30 miles or more were classed as non-commuters.
6-high school decile rank	Discrete variable where students in the top 10 percent of their class are assigned a value of 1 and students in the bottom 10 percent of the class are assigned a 10. Individuals who either did not graduate from high school or who

	earned a GED will be assigned a value of 11.
7-graduation status	For high school graduation status three groups were created. 0 = non-high school graduate, 1 = those who received a graduate equivalency diploma (GED), and 2 = those who had graduated from high school.
8-major	Major was divided into three discrete groupings each treated as a dichotomous variable. GS or general studies, if selected by the student = 1, if not selected = 0. LA or liberal arts, if selected by the student = 1, if not selected = 0. Business/ technology represents all other degree programs including nursing. If selected = 1, if not selected = 0.

Analysis

The project began with the identification and definition of data elements needed from each of the college's computerized systems (admissions, testing and registration) and the combination of these data elements into one concatenated file on the mainframe. This file was down-loaded to a dBase III+ file for use on a microcomputer. The dBase file was used to cull out those records required for the study from all who applied for the Fall 1988 term. The dBase file was then translated to LOTUS 1-2-3 to provide an environment in which the data could be most easily changed into codes appropriate for statistical analysis. When

the coding was complete all pertinent data was copied to a Minitab file for analysis. At this point basic descriptive statistics were observed for the two sub-populations.

A review of the population of individuals who applied, who were accepted and paid their deposit for the Fall 1988 semester showed a total population of 557, this was made up of 507 attendees and 50 non-attendees. Complete data was available for all but three variables. The date of birth was missing from two of the "non-attendees" files, as a result age could not be computed for them. Graduation status, could not be determined from the records for 7 individuals and high school decile rank was not available for 122 individuals. The fact that rank was not available is related to several factors: first, community colleges typically accept people who either have not graduated from high school or who have earned a GED, second, many high schools have grading practices that preclude the ability to generate high school ranks, and finally some prospective students failed to submit their high school transcripts. The data sets revealed that 20 individuals had not graduated from high school and 56 had received GEDs.

In comparing the groups "attendees" and "non-attendees" on the variables studied it became apparent that student characteristics were more often alike than different. While commuting status was treated in the regression analysis as a dichotomous variable it

was first derived and examined as a continuous variable; a measurement of the number of miles that an applicant lived from the college. Group similarity is readily apparent in the following table:

TABLE #1

Distance that the individual lived from campus at the time of application. (expressed in miles).

	N	Mean	Median	Min	Max
Non-attendees	50	34.6	12.5	1.0	183.0
Attendees	507	33.3	12.0	1.0	1350.0

The mean and median are almost identical for both groups. In examining the extended range for the attendees it was noted that 16 individuals from the total population lived in excess of 183 miles from the college, all were attenders. A tentative conclusion could be made that applicants who live great distances from campus tend to be attenders. Results on another continuous variable, age, were similar as shown below:

TABLE #2
Age of Applicants

	N	Mean	Median	Min	Max
Non-attendees	48	22.1	19.4	17.2	36.2
Attendees	507	22.7	19.6	16.3	54.1

Other than the extended range, which could be expected with a larger "N" there is no apparent difference in age between

"attendees" and "non-attendees." These findings run counter to those reported by Slark who found that non-registrants were older in the 25-40 range and the study at Kapiolani where it was found that 43% of the no-shows were above 25 years of age. The timing of the submittal of an individual's application was held to be important with some contending that late applicants would almost surely be attenders, while others felt that early appliers were better planners and more likely to attend. In examining both REFDATE and the actual number of days prior to the start of the semester that the application was received, it was found that there is little difference between the groups. Looking at the number of days prior, the mean for attendees was 55.7 days while for non-attendees it was 67.1 days, however, for both groups the median was 41 days.

As a precursor to the stepwise regression analysis an intercorrelation matrix was generated, see table #3 below.

TABLE #3
INTERCORRELATION MATRIX

	COMMUTER	GRAD STAT	HS DECILE	REF DATE	PCOLLEGE	GS	LA	B/T	AGE	GENDER
GRADSTAT	0.039									
HSDECILE	0.093	0.130								
REFDATE	-0.171	-0.087	-0.000							
PCOLLEGE	-0.025	0.012	-0.122	0.183						
GS	0.103	-0.127	0.175	0.042	-0.042					
LA	-0.050	0.050	-0.111	0.097	-0.028	-0.206				
B/T	-0.032	0.048	-0.024	-0.114	0.054	-0.544	-0.709			
AGE	-0.172	-0.197	0.048	0.171	0.384	0.035	-0.081	0.045		
GENDER	0.108	-0.092	0.224	0.085	-0.057	0.124	0.046	-0.129	-0.065	
ATTEND	-0.111	0.095	0.087	0.070	-0.014	-0.003	0.024	-0.019	0.024	0.039

As was expected, a strong negative correlation showed between those selecting the business and technologies (B/T) major and general studies (GS)/ liberal arts (LA). Due to the high intercorrelation B/T was not used in the stepwise multiple regression analysis.

The data was submitted to a stepwise multiple regression analysis using Minitab. In order to allow as many variables as possible to be given consideration Fenter and Fremove were both set to 0. The values of the first seven variables to enter the stepwise regression are contained in table #4.

Table # 4

STEPWISE REGRESSION OF ATTEND ON 10 PREDICTORS, WITH N = 433

N(CASES WITH MISSING OBS.) = 124 N(ALL CASES) = 557

STEP	1	2	3	4	5	6	7
CONSTANT	0.9357	0.2965	0.2990	0.2280	0.2416	0.2204	0.2175
COMMUTER	-0.090	-0.090	-0.095	-0.085	-0.088	-0.086	-0.086
T-RATIO	-2.77	-2.79	-2.95	-2.58	-2.67	-2.59	-2.57
GRADSTAT		0.32	0.29	0.30	0.30	0.30	0.30
T-RATIO		2.62	2.38	2.47	2.41	2.43	2.43
HSDECILE			0.0093	0.0090	0.0079	0.0077	0.0076
T-RATIO			1.71	1.67	1.43	1.39	1.34
REFDATE				0.059	0.056	0.054	0.055
T-RATIO				1.63	1.53	1.45	1.45
GENDER					0.029	0.030	0.030
T-RATIO					0.99	1.02	1.02
AGE						0.0009	0.0010
T-RATIO						0.40	0.43
PCOLLEGE							-0.005
T-RATIO							-0.16
S	0.274	0.272	0.272	0.271	0.271	0.272	0.272
R-SQ	1.75	3.29	3.94	4.54	4.76	4.79	4.80

The stepwise regression shows commuter status entering first, followed by graduation status, high school decile rank, and then refund date. Though commuter status entered first the stepwise R is only .274, which is not considered to be significant. R-Squared indicates that this variable alone accounts for only 1.75% of the variance between the "attendees" and "non-attendees" groups. Collectively, the first four variables to enter accounted for only 4.54% of the variance between the groups of attendees and non-attendees.

Although not part of the original design, it was decided to submit the data to a discriminant analysis to see the degree to which these variables would predict group membership as either attendees or non-attendees. Minitab's linear discriminant analysis function with cross validation was used. Based on the variables in this study, group membership of individual cases could be predicted correctly 75% of the time for the overall population. Membership in the attending group was predicted correctly 78% of the time. Yet, the same variables were only successful in correctly predicting membership in the "non-attendee" group at the 47% level, while chance probability would predict at the 50% level.

CONCLUSION

The primary purpose of the study was to identify individual

characteristics from data available during the admissions process that would predict non-attendees. Once non-attendees were predicted it was hoped that the admissions office could establish intervention strategies that would succeed in retaining some of those predicted to be non-participants. The results of both the stepwise multiple regression analysis and the discriminant analysis clearly indicate that such a prediction cannot be made on the basis of the data currently collected during the admissions process at Tompkins Cortland Community College. As a result it was impractical to carry out phase II, the creating of a model to predict non-attendees from the pool of full-time applicants.

RECOMMENDATIONS FOR FUTURE RESEARCH

1. Qualitative follow-up studies of non-attendees in which the researchers interview "non-attendees" may be helpful in locating common characteristics of this population. Unfortunately most of the existing institutional research autopsy studies have yielded reasons for non-attendance that relate to personal problems or the attainment of employment, both factors that are difficult to collect or know during the time of application processing.
2. Lack of information on the applicant's academic performance in high school may have been a problem in this study. More complete HS decile rank information as well as other indicators of academic performance may be needed.
3. Several individuals at the college feel that the college's

athletic program may be a significant factor in recruiting students. McMaster found athletics to be one of the reasons given by their non-attendees for going to another college. Athletics, then may be a factor in determining attending or non-attending behavior. The college's revised admissions system is now keeping track of an applicant's interest in athletics. It will be possible to test for this variable in future studies.

4. Because non-commuting students were somewhat less likely to be "non-attendees" and specifically that applicants who lived a distance from the college (more than 183 miles) were all attenders, it might lead the admissions office to look at recruiting farther from home. If this type of recruitment policy is put into effect what will happen to the rate of attendance of individuals who live a distance from the campus?

5. As this study was geared to look at the earliest stage of attrition it may be useful to look at retention literature for additional clues to the behavior of the non-attending population. Although the admission process as it now exists does little to capture information that would assess the person-environment fit described in retention literature perhaps more needs to be done to understand how this affects early decisions to drop out or not attend.

While the results of this study were disappointing in that a model could not be developed to predict non-attenders, it has

dispelled currently held beliefs about this population. No longer will we assume that commuter applicants, or high school graduates, or older students are more likely to be "attendees." Other factors yet unknown are at work causing some individuals who were committed to attend to fail to participate in the college experience.

(25) Non-attendees.df4

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